



Thermodur

DIN 2344

H13

AISI H13

X40CrMoV5-1

C 0.39 Si 1.00 Cr 5.40 Mo 1.35 V 1.00

Steel properties

High hot-wear resistance and hot durability further pretty much as good toughness, thermal fatigue resistance, in status to hot cracking, hot wear and plastic deformation. will be cool to a restricted extent.

Standards

AISI H13

AFNOR Z40CDV5

Physical properties

Coefficient of thermal expansion

at °C	20 – 100	20 – 200	20 – 300	20 – 400	20 – 500	20 – 600	20 – 700
10 <sup>-6</sup> m/(m · K)	10.8	12.0	12.4	12.7	13.1	13.3	13.5

Thermal conductivity

at °C		20	350	700
W/(m · K) Annealed		27.1	30.4	33.2
W/(m · K) Quenched and tempered		25.4	27.7	30.4

Applications

This grade is especially used for ejector pins, tool holders and shrink work chucks. It is wide used for manufacture of casting dies, extrusion dies and forging dies.

Heat treatment

Soft annealing °C  
760 – 810

Cooling  
Furnace

Hardness HB  
max. 240

Stress-relief annealing °C  
approx. 610 – 660

Cooling  
Furnace

Hardening °C  
1030 – 1060

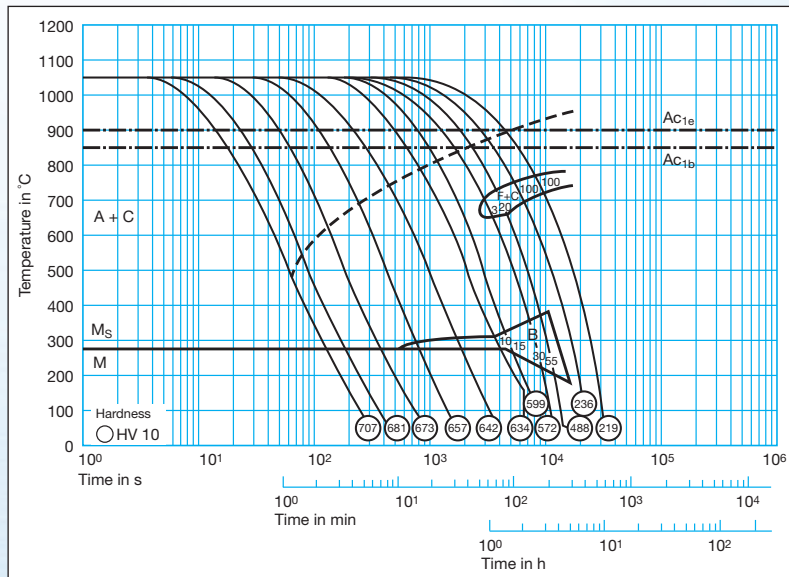
Quenching  
Air, oil or  
saltbath, 500 – 550 °C

Hardness after quenching HRC  
55

Tempering °C  
HRC

100	200	300	400	500	550	600	650	700
54	53	53	55	56	54	51	43	34

Time-temperature-transformation diagram



Tempering diagram

